



## Technology Evaluation for Environmental Risk Mitigation Principal Center

### Low-Temperature Cure Powder Coatings

JG-PP Project Number: WP-0614

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### Background

New powder coating materials have been developed (e.g., by GE Global Research and Crosslink Powder Coatings Inc. during SERDP Project PP-1268) that cure at relatively low temperatures (below 250 deg F). These coatings are also durable, corrosion-inhibiting and weather resistant.

### Objective

To demonstrate/validate powder coating resins for corrosion-protection of temperature-sensitive weapon system components (aluminum, steel and magnesium substrates).

### Period of Performance

- February-2006 to November-08

### Stakeholders

Air Force (Project Lead: Air Force Material Command), Navy, Department of Energy, and NASA monitoring

### Benefits

- New low-temperature cure powder coating technology will improve the manufacturability, use, and repair of temperature-sensitive, coating-protected weapons, aircraft, and auxiliary equipment.
- Elimination of toxic chemicals and VOCs thus minimizing risks to human health and environment.
- Reduced costs associated with regulations.
- A typical powder coating resin has the potential to reduce labor and material costs by a factor of 10 or more while total wastes and VOCs can be reduced by a factor of 100 or more.

### Document Status

- Joint Laboratory Test Protocol – Complete August 2006
- Joint Test Report – In progress

### Recent Progress

- Planning for follow-on field testing is underway with the Navy and Air Force participating.

### Milestones

- Completed Joint Test Protocol – August 2006.
- Panels for NASA specific tests (Outgassing and Flexibility) were prepared by the Project in-kind – September 2006.
- Boeing-Huntington Beach performed outgassing tests (in-kind contribution), but the samples were contaminated and all samples failed – March 2007.
- Kennedy Space Center Corrosion Technology Laboratory completed flexibility testing; the coating did not pass the low temperature flexibility requirement – July 2007.
- Based on the results of the flexibility testing, it was decided to not re-conduct the NASA outgassing test – October 2007.
- Testing identified in the Joint Laboratory Test Protocol is complete and initial results are very positive – November 2008.
- Follow-on field demonstrations are currently being planned to further evaluate the coating's potential.

### Near-Term Goals

- Complete plans for follow-on field demonstrations and begin testing.